AMATEUR SATELLITE REPORT

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AMSAT-LU Reorganizes, Elects Officers and Pursues Packet Satellite Project

AMSAT Argentina (AMSAT-LU) has reorganized in a formative meeting May 8 in Buenos Aires. The new organization has announced the result of its election of officers as follows:

President	Carlos A. Huertas, LU4ENQ
First Vice President	Arturo H. Carou, LU1AHC
Second Vice President	Hugo Lorente, LU4DXT
Director	Norberto G. Pennini, LU8DYF
Secretary	Osvaldo Gago, LU6ELO
Treasurer	Alfredo L. Fraire, LU6DWA

The term of office is one year. Also appointed was an extensive technical committee to coordinate an AMSAT-LU satellite project.

By a happy coincidence, AMSAT-NA's Vice President Jan King, W3GEY, was in Argentina at the time of the organizational meeting and took part in the proceedings as a venerated and highly honored guest. He was elected and Honorary Member of AMSAT-LU. (See photo) Jan is a founding Director of AMSAT-NA, the parent organization of the more than two dozen related organizations active today. Jan was in Buenos Aires as part of a U.S. delegation preparing for the Mobile WARC later this year.

In a June 2 letter to *ASR*, AMSAT-LU President Carlos Huertas says:

"In a luncheon arranged for Jan by Arturo, LU1AHC, I explained to Jan some of the news concerning AMSAT Argentina. I explained:

1) The election
2) The growth of packet radio activity
3) The gateway to OSCAR 11 bulletins
4) The gateway of the AMSAT-BBS through an IBM network
5) The experiments we have begun including digipeaters in airplanes and perhaps balloons as well
6) The LU-Sat project plans including a digipeater in orbit

"Some days later Jan gave a talk at the Radio Club of Argentina with Arturo doing the translation. Then on May 8, Jan attended the formative meeting of AMSAT-LU at my QTH near Ezeiza International Airport. Fortunately Jan's flight plans allowed him to spend more than 3 hours with us.

"AMSAT Argentina began with 99 foundation members, a number that was beyond our greatest expectations at the start. We are now at 115 members and growing week by week.

"A week after Jan departed I gave a presentation to the Institute for the Investigation of Science and Technology where I explained about the LU-Sat project. They were very interested and as a result we have been assured we can use the Institute's facilities for vibration tests, thermal tests, impact and vacuum tests, antenna range and more.

"Moreover, we now have the support of the Communications Secretary of the National Commission for the Investigation of Space."

The new AMSAT-Argentina: Left to right, front: LU7ABF, LU8DYF, LU9DMC, W3GEY, LU4ENQ. Left to right, rear: LU6DWA, LU2EXS, LU1AHC, LU5EJA, LU1ESY, LU7JCN, LU1EXC, LU6ELO, LU1EBB. (See story)

New Stations Join UO-11 DCE Net

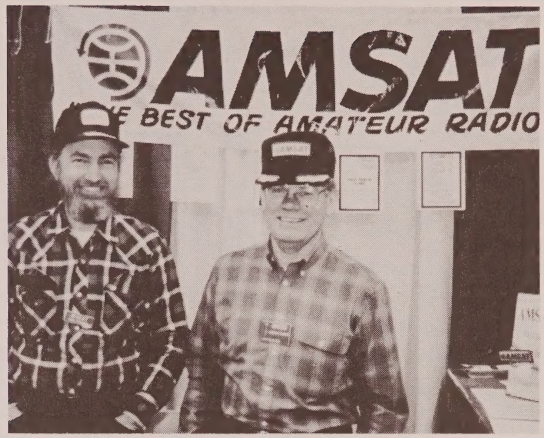
The UO-11 Digital Communications Experiment (DCE) continues to be heavily used with messages from several UK packet radio bulletin boards being forwarded to the Australian gateway station, VK5AGR. VK5AGR is operated by Graham Ratcliffe (one of the AO-10 control operators) in Adelaide. Messages destined for other parts of Australia are forwarded by Graham on HF packet radio.

Two further DCE gateways have accessed the satellite: Ian Ashley (ZL1AOX) in Auckland, New Zealand and John Biro (K1KSY) in Massachusetts, USA, have both tested their DCE stations. Surrey expects these gateways to be fully active shortly.

Keplerian elements are also being provided on the DCE and are available by any UoSAT receiving station. They are provided in specially formatted DCE Title frames. They can be received either as standard ASCII or as DCE frames with CRC error checking.

Extensive testing of the Charge Coupled Device (CCD) camera system is currently under way. With the very accurate ground pointing of UO-11 achieved using magnetorquing under OBC control, tests of the CCD camera are proceeding. Images are being downloaded at UoS on a regular basis with the aim of finding a combination of camera integration time and sensitivity settings which results in usable pictures. The provision of 16 "exposure settings" makes setup of the CCD camera a complex and time-consuming process.

At least one UoSAT receiving station in Europe (HB9RKR) has been listening in on the CCD and magnetorquing experiments which use the 4800 bit/sec DSR output on 70-cm. HB9RKR is using the home-made high-speed demodulator and wide-band receiver which he described in Oscar News. In a recent letter, he included graphs of 70-cm signal strength at his station and some very good copy from DSR magnetometer data dumps.



Charlotte Hamfest and Roanoake Division Convention, March 1987. Left, Carl Starnes, W4EAT; right, Sherman Starnes, W4TZU.

1987 Member Recruitment Drive

Item	Donor	Description
1. IC-275A	ICOM	2m all mode xcvr
2. Landwehr 2m mast-mount GaAsFET Preamp	Henry Radio	
3. MicroPatch MP-20	AEA	Morse/Baudot/ASCII unit*
4. SP-432VDG	ARR	70cm switched GaAsFET preamp
5. PAI-144B	Lunar	2m switched preamp
6. Choice of any AMSAT software	AMSAT	Includes new N4HY QUIKTRAK
7. F9FT 38 element crossed yagi	PX Shack	70 cm model
8. F9FT 9 element yagi	KJI Electronics	70 cm model
9. 1987 ARRL Handbook, clothbound	ARRL	
10. 1 year gift subscription to Ham Radio Magazine	HR magazine	

* For use with VIC-20 computer.

Prize List
1987 "Self-Renewal" Program

Grand prize drawing November 7, 1987 at the 1987 Annual Meeting in Detroit. Grand prize package consisting of the following. A complete satellite autotracking system consisting of:

C-64 Commodore computer
Commodore disk drive
Monitor
N4HY QUIKTRAK software
KenPro/Encomm KR010 rotor interface for C-64
KenPro KR-5400A dual axis rotor
KLM 435-40CX 70 cm crossed yagi
KLM 145-22C 2 meter crossed yagi

Call For Achievements Log; Time to Polish Amateur Radio's Image

As part of a major effort to enhance Amateur Radio's image in important government and public circles and to document the role of Amateur Radio's contribution to society, AMSAT is enthusiastically supporting ARRL's call for a recounting of special achievements in Amateur Radio. ARRL plans to include these milestones in an upcoming book commemorating ARRL's 75th anniversary. Your help is essential if the job is to be done right!

We're looking for reports of contributions made by Amateur Radio to technology, public service and personal development between 1945 and today — reports confirming Amateur Radio's strong tradition of living up to its basis and purpose as set forth in Section 97.1 of the FCC rules.

What part has Amateur Radio played in technological innovation, refinement, development and research since 1945? What communications milestones have been credited to Amateur Radio in emergency and other public service work and for the enhancement of people-to-people communication including the increasing participation in Amateur Radio by the handicapped? What technology has derived specifically within the Amateur Satellite service in response to peculiar technical problems encountered in satellite communications?

Amateur Radio serves as the springboard for many technical careers as well as contributing to technological awareness and education — what hams do you know and know of who can credit Amateur Radio with getting them started in a technical career? Please help us gather the "what, why, when, how, who, and where" about each Amateur Radio milestone you'd like to see reported in ARRL's 75th anniversary book and included in a presentation to important government officials. THIS IS IMPORTANT! Please send your milestone news to AMSAT HQ by October 1, 1987. AMSAT will collect reports and forward to ARRL on your behalf.

Membership Drive Offers Thousands In Free Equipment

Membership promotion is the theme of two major thrusts by AMSAT HQ as the convention and hamfest season swings into high gear. This year AMSAT has two significant membership programs aimed at encouraging current members to renew early and for members to encourage their friends and acquaintances to become AMSAT members too.

The two programs work like this.

First is the new member recruitment program. For each new or renewing member you sign up, you get a point. Top point-getters win big prizes. The top point holders as of October 31 get their choice of a notable suite of prizes. Top prize is the IC-275A all mode 2 meter transceiver. Other prizes include satellite antennas, GaAsFET preamps, software and much, much more. The complete prize list appears elsewhere in this *ASR*.

Second, when you renew YOURSELF, you become eligible for a drawing for a complete satellite autotracking system package. The autotrack package consists of a Commodore 64 computer, disk drive, tracking software, display, Encomm /Kenpro KR010 rotor interface, Kenpro KR5400A dual axis rotor, together with KLM 40CX and 22C antennas. The entire package will be awarded to the lucky renewer by a drawing from all members renewing between May 22 and October 31. The drawing for the autotrack package will be done at the AMSAT Annual Meeting on November 7. When you renew, even if you renew early, you get one entry to the drawing. And you can renew for as many years as you like. Each annual renewal counts for one entry. Life members can participate as well by subscribing to a Sustaining Life Membership for 1987 or beyond. Life Members should look for a special letter to them in the mail soon.

All new members or renewals will receive a special bonus of a free supply of member (or special life member) decals to affix to your QSL cards. These handsome two color decals are the size of a large Air Mail stamp and have the AMSAT logo proudly displayed for you to let everyone know you're a member of AMSAT.

Get started now. To be eligible for the IC-275A, sign up as many new or renewing AMSAT members as you can. To be eligible for the autotrack system, renew yourself today. All renewals submitted between May 22 and October 31 are eligible. Drawing will be held at the Annual Meeting on November 7. Send an SASE to AMSAT today for contest rules and membership application blanks. Write to AMSAT, P.O. Box 27, Washington, D.C. 20044.

Short Bursts

• Launch of RS-9 has been delayed further says PAØDLO quoting Russian sources. He says the launch will not occur in June and that additional modifications of the RS-9 systems are under way. These could affect the modes of operation as well as the frequencies.

• RS5 and RS-7 will be available for use on the 10th orbit of each day (except Wednesday) through June 30th says PAØDLO. Then, from July 1 through July 25, both will be available for use on the 9th orbit of each day (except Wednesday). Both satellites are in poor condition with their batteries virtually useless after 6.5 years in orbit.

• The MAREX (Mir Amateur Radio Experiment) is not imminent says G3IOR. Reports to the contrary have been unduly optimistic Pat says. The most recent achievement has been the completion of the transceiver to be used. This may have sparked recent speculation that MAREX activity was at hand, Pat concluded.

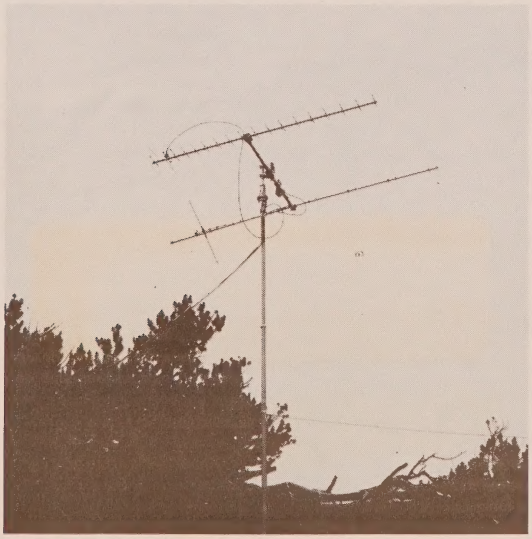
• Leonid Labutin, UA3CR, will be visiting Canada in early July to consult with Canadian authorities on the joint Russian-Canadian polar expedition next winter. (See *ASR* #150).

• HB9RHV will operate AO-10 from Liechtenstein, HB0, in July. He's planning to be on July 6 to July 15. Listen for him around 145.910 MHz.

• AMSAT-NA President WA2LQQ emphasizes the importance of all Area Coordinators and members making use of the summer months to develop new membership. He says it's vital to continue the drive for new membership and renewals so that AMSAT can continue to provide the level of services members have become accustomed to. Do your part today. Renew promptly and get a friend to sign up today. AMSAT needs your help now.

• The Soviet Union successfully tested the world's largest rocket booster May 15. The 6.6 million pound thrust Energia will support future USSR manned missions to the moon or Mars U.S. sources indicated. The Saturn 5 class booster has the capability of launching 220,000 pounds of space station or military satellite payloads into low earth orbit. This is four to five times the maximum capacity of the U.S. Space Shuttle. The successful test will also accelerate the USSR's shuttle program said to be only months away from initial test. The U.S. is at least 7 to 8 years away from a similar payload capability according to Aviation Week magazine.

• Barrie, Ontario will be the site of the third Packet Radio Symposium co-sponsored by the Barrie Amateur Radio Club and Georgian College in Barrie. TAPR President Lyle Johnson, WA7GXD, will be the featured speaker at the symposium September 19. Packet discussions for beginners start at 9:30 with the featured presentations commencing at 1 PM. Networking will be emphasized at this year's symposium. Talk-in on 146.25, VE3LSR. Registration is $5.00. Inquire with the Hex-9 Group, Box 254, Barrie, Ontario, L4M 4T2, Canada. Pre-register via packet: VE3FJB.



HB9RHV will operate AO-10 from Liechtenstein (HBØ) July 6 through 15. Downlink 145.910 MHz. The array shown was used for the 1986 HBØ operation.

Radio Sputnik 9 Telemetry Information

by Nico Janssen, PAØDLO

There are 16 analog channels and 16 digital status channels, transmitted in CW. The format of each channel is: XXYY. XX is the channel identifier and consists of two letters. Usually the first letter will be either I or A. The first letter may change to either N or M to indicate that the command receiver in the satellite is receiving command signals in the command uplink. YY is the 2 digit telemetry value. In the analog channels this number may vary from 00 to 99. In the digital status channels this number is either 00, to indicate a digital "low", or a fixed number not equal to 00, e.g. 50, to indicate a digital "high".

Analog telemetry channels:

Identifier	Parameter
IS or NS	Output power 29 MHz transmitter
IR or NR	Output power 145 MHz transmitter
ID or ND	Output voltage 20 V power supply unit
IG or NG	Voltage at transponder IF bandpass #1
IU or NU	Voltage at transponder IF bandpass #2
IW or NW	Voltage at transponder IF bandpass #3 (wide)
IK or NK	Service command parameter 29 MHz mode
IO or NO	Service command parameter 145 MHz mode
AS or MS	Temperature 29 MHz transmitter
AR or MR	Temperature 145 MHz transmitter
AD or MD	Temperature 20 V power supply unit
AG or MG	Temperature 9 V power supply unit
AU or MU	Control parameter backup 9 V power supply unit
AW or MW	Voltage at IF of 21 MHz ROBOT receiver
AK or MK	Voltage at IF of 145 MHz ROBOT receiver
AO or MO	ROBOT log QSO counter

Digital status channels:

Identifier	Parameter
IS or NS	Transponder -10 dB attenuator in/out
IR or NR	Transponder -20 dB attenuator in/out
ID or ND	Telemetry data source sampling period 10 or 90 min
IG or NG	Transponder 29 MHz on/off
IU or NU	Transponder 145 MHz on/off
IW or NW	Special command station channel on/off
IK or NK	Output power beacon #1, 29 MHz, high/low
IO or NO	Output power beacon #2, 145 MHz, high/low
AS or MS	Special service channel for command stations
AR or MR	Special service channel for command stations
AD or MD	Special service channel for command stations
AG or MG	Special service channel for command stations
AU or MU	Output information from memory via beacon 1 or 2
AW or MW	Attenuator 21 MHz ROBOT receiver in/out
AK or MK	Attenuator 145 MHz ROBOT receiver in/out
AO or MO	Output power special command station channel on 145 MHz high/low

[Telemetry equations to be supplied by PAØDLO when available — Ed]

AMSAT Technical Journal *Now Available*

AMSAT Technical Journal Editor Bob Diersing, N5AHD, says work on the historic first edition is now complete and it will soon be coming off the presses. The first edition contains papers from around the world on the subject of Amateur Radio satellites, tracking and telemetry. A limited number of these first rate technical journals are available. You must order them directly from AMSAT Headquarters before they run out. Reviewers have strongly suggested this is the finest collection of AMSAT engineering papers assembled for publication since AMSAT's founding 18 years ago. With this quality involved, the limited number of copies will soon be gone so don't miss out. Place your order today. Call or write AMSAT HQ to reserve your copy. The price is $10 plus postage and handling. You may call in your order at 301-589-6062 and order immediately using your Visa or Mastercard.

Improved AO-10 Draws User Return

Very good operating conditions have returned to AMSAT OSCAR 10, Mode B. Much improved sun angles and good cooperation by users in adhering to the operating guidelines have combined to provide the very good conditions.

Because of the favorable conditions and good user compliance, the command team decided to increase the operating time. Beginning Monday, June 8, UTC, the operating schedule was increased to allow operation from MA 20 through 250. This schedule will remain in effect until July 20. The satellite is currently experiencing perigee eclipses so it must not be used after MA 250. It is now concluded the 2 meter omni antenna is switched in line.

With the return of favorable operating conditions to AO-10, many rare DX stations are also on according to G3IOR. Pat says the following have recently been on AO-10: VKØLM, 8Q7CH, BV2B, UAØALA and UK8OB.

AO-10 will be available for the ARRL Field Day activity this year. The estimated peak of solar power later this month will very nearly coincide with Field Day so a very good operating period should result. AMSAT-NA members planning to operate AO-10 on Field Day are encouraged to send for information brochures to hand out during the Field Day satellite demonstrations. Simply request a quantity of brochures from AMSAT Headquarters along with some membership application blanks. In this way you can demonstrate AO-10 and sign up a few new members as well. Then you may win a big prize in this year's member recruitment drive.

Please stay in tune with official bulletin sources for any schedule changes.

African Packet Experiments Continue

Recent HF packet radio experiments between ZS6AKV and VE3JPC/6W have proven very successful. Jim, VE3JPC, is currently in Senegal to attend a conference on information flow in Third World countries. Packet radio is one of the modes being discussed. Jim is also involved with the packet radio experiment being planned by 7PBDL. He called the Lesotho station who, in turn, alerted SA AMSAT President Hans, ZS6AKV. The purpose of the exercise was to prove to other conference delegates that packet radio could be successfully operated on HF. Conditions were extremely poor with signals barely raising the S-meter. Nevertheless, contact was established and short messages were in fact exchanged.

FO-12 Shut Down For Recharge After Recent Testing Drains Battery

The FO-12 On Board Computer (OBC) difficulty of mid-May has been tentatively attributed to a soft error. Testing resumed with the bird in Mode JD beginning May 26. Late that week the on board power regulators shut the system down when battery voltages sagged under the heavy testing load imposed. The satellite was off for battery recharging until Tuesday, June 2, when testing of the Mode JD software continued. FO-12 had been continuously operating for as long as 72 hours in Mode JD when the shut down occurred.

Tak Okimoto, JA2PKI, of JAMSAT says the FO-12 On Board Computer (OBC) has 1 Megabyte of error correcting memory. This means that the units have a hardware error detection and correction (EDAC) mechanism in order to correct 1 error bit per byte. However, Tak says, to correct for 2 or more bit errors per byte, an additional software error correction and detection routine should be employed. With the current version of the program, no software routine to correct the errors is used, he says. Tak did not indicate when work on the software error correction routines would be ready.

JARL says it needs FO-12 PSK telemetry data of the satellite when it's in eclipse. If you obtain telemetry frames where channel #0 indicates 000, please mail the data as soon as possible to AMSAT HQ, P.O. Box 177, Washington, D.C. 20044.

In a previous report we said the flight backup satellite unit, JAS-1A, was being used to debug software. We have now learned this is incorrect. The flight backup unit is in cleanroom storage with the battery removed and is not being used at all. The software test bed, we are now told, comprises an OBC engineering development unit, EM#1. A second unit, EM#2 using static RAM in place of the dynamic RAM used in the EM#1, is being used for software debugging.

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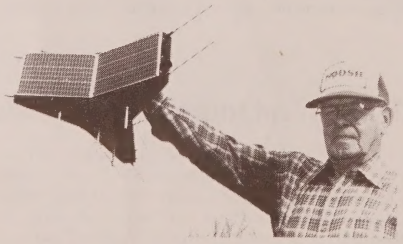

Monty Munro, NØDSH holding one of his AO-10 models. (KAØFQR photo)

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